



Transforming through Innovative Leadership (TIL)

The TIL Group, LLC

A Turnaround Strategy for Modeling and Simulation in Hampton Roads

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CHMURAECONOMICS&ANALYTICS

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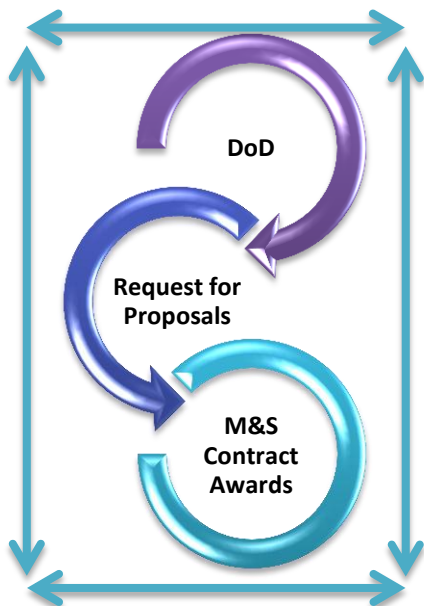
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Executive Summary

Modeling and simulation (M&S) as an industry is made up of a core group of firms located in Hampton Roads, Virginia whose business model is largely based on providing M&S solutions to the federal government. The Chmura report “Modeling and Simulation in Hampton Roads” (10/1/2012) provides an economic analysis for two segments of M&S firms—core and allied. The core industries are groupings of firms in Hampton Roads that are likely to have the capacity to both develop and apply M&S models to their core business operations as well as to sell it to other firms. The allied industries in Hampton Roads are the companies outside the core definition, such as healthcare or shipbuilding that apply M&S technologies to deliver their products more efficiently to their clients. This is an important distinction as it impacts the design and functionality of the Transforming through Innovative Leadership (TIL 2012-2017) strategic plan. The plan presents a turnaround plan for the core industries and their respective niche products away from government focus to one of non-governmental market opportunity focus. The successful implementation of this strategy will result in job creation for M&S core and allied industries. The strategic plan is a roadmap to take Hampton Roads from the ‘as is’ DoD-centric M&S focus to the ‘to be’ desired future state through the efforts of the TIL Group.

The M&S ‘As Is’ Contract-award Business Model Dependent on the RFP Process



The M&S ‘To-Be’ Market Access Model Focused on Private- Market Principles



Source: Chmura Economics & Analytics

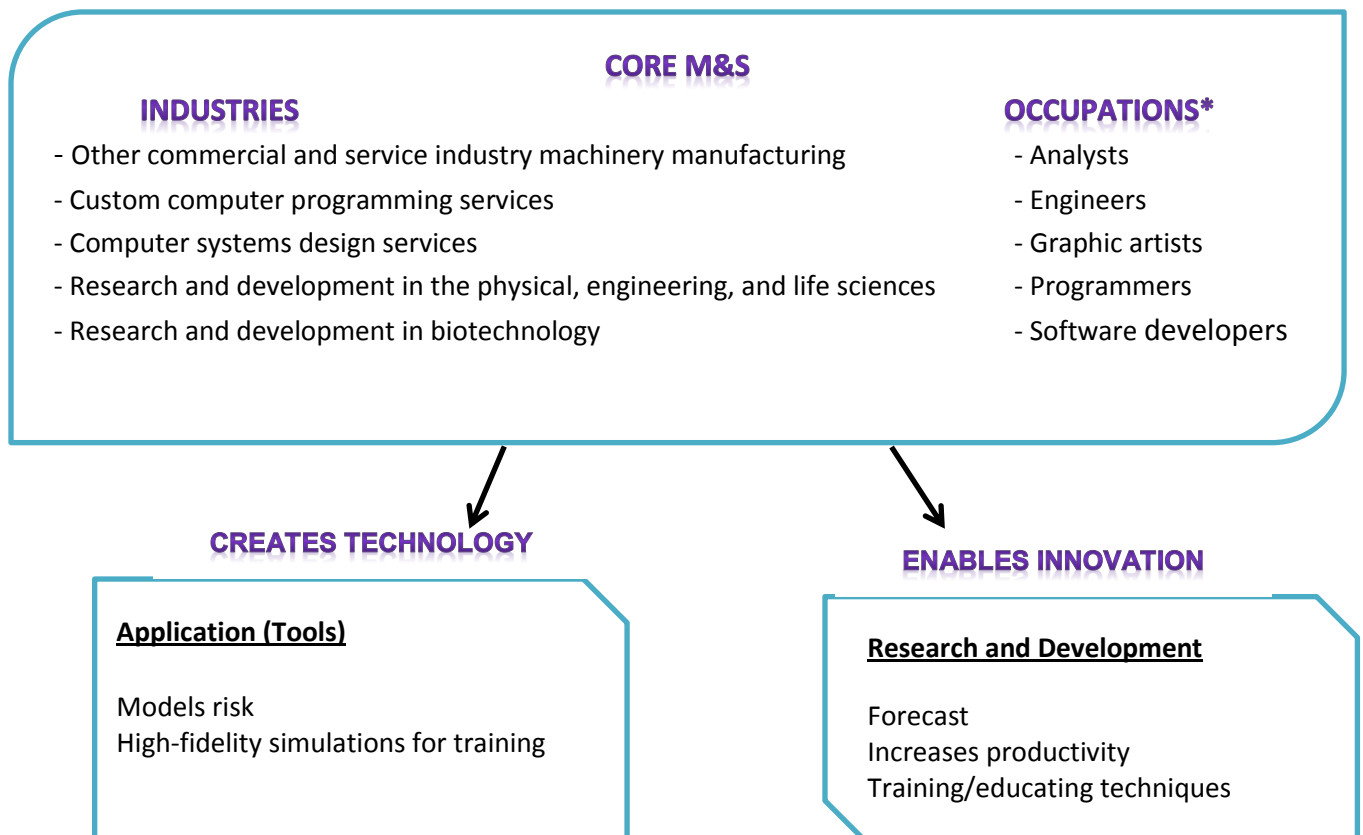
Background from the Chmura Report

Modeling and simulation (M&S) has the potential to revolutionize the way businesses operate.

- Manufacturers find ways to streamline toward greater productivity or work through bottlenecks.
- Businesses such as insurers and financial institutions use stochastic models to assess potential risk.
- Military and training providers use high fidelity simulations to offset the cost and danger of training in the field as well as train for strategic mission coordination.
- Educators are increasingly using three-dimensional immersive virtual worlds to teach a new generation of visual learners.
- Health care providers use it in training, research, and product development.

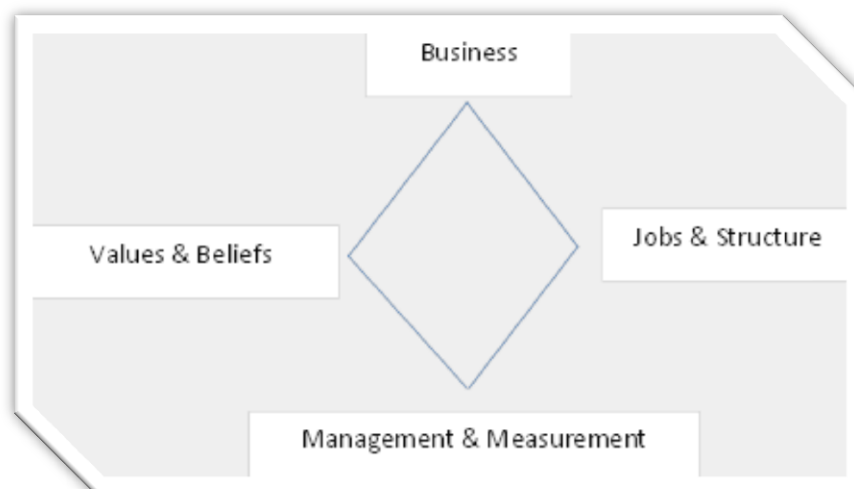
Modeling and Simulation is defined in this study as a group of core industries and occupations that enable innovation and create technology. (For more detail, see Section 4.1 of “Modeling and Simulation in Hampton Roads” (9/10/2012))

- The industries shown in the diagram correspond to North American Industry Classification System (NAICS) codes 333318, 541511, 541512, 541711, 541712, respectively.



The Four Business Processes Guiding TIL

The strategic plan is designed to provide three levels of decision support over a five-year period. The TIL plan is organized to strategically inform the owner of the plan on these four points in each of the business processes:



The Business

The TIL Group's business model is one of strategy execution to implement the plan. The tactical efforts from the team will focus on three important fronts:

1. Revenue generation to become sustainable and profitable
2. Managing the marketing campaign for the turnaround strategy
3. Delivering results that meet the expectations from the investors

The TIL Group's mission is to create value for its customers. The implementation of the TIL Plan requires the TIL Group to perform both strategically and tactically; the strategies point to scenarios for private market focus. The objectives and tactics ground the work of the TIL Group as the 'go to' organization to bring new M&S technologies to customers that need the solutions M&S can provide.

Strategic management oversees the key initiatives taken by a company's top management on behalf of owners, allocates resources and measures performance with external customers, public, government relations, environmental, and regulatory entities. The TIL Group will specify the organization's mission, vision and objectives; and will develop policies and plans, usually in terms of projects and programs, which are designed to achieve their objectives. Through strategic resource development and allocation, TIL's mission is to implement the policies, plans, projects, and programs. A strategic map is used to provide a roadmap and illustrate the results of the TIL Group's progress towards its objectives. The strategy map engages all stakeholders in the 4-point business diamond. The stakeholders for the TIL are 1) the Governor's M&S Advisory Council; 2) the TIL Group employee stock owners; 3) the investors in TIL, including business members; 4) the TIL customers; 5) the residents of



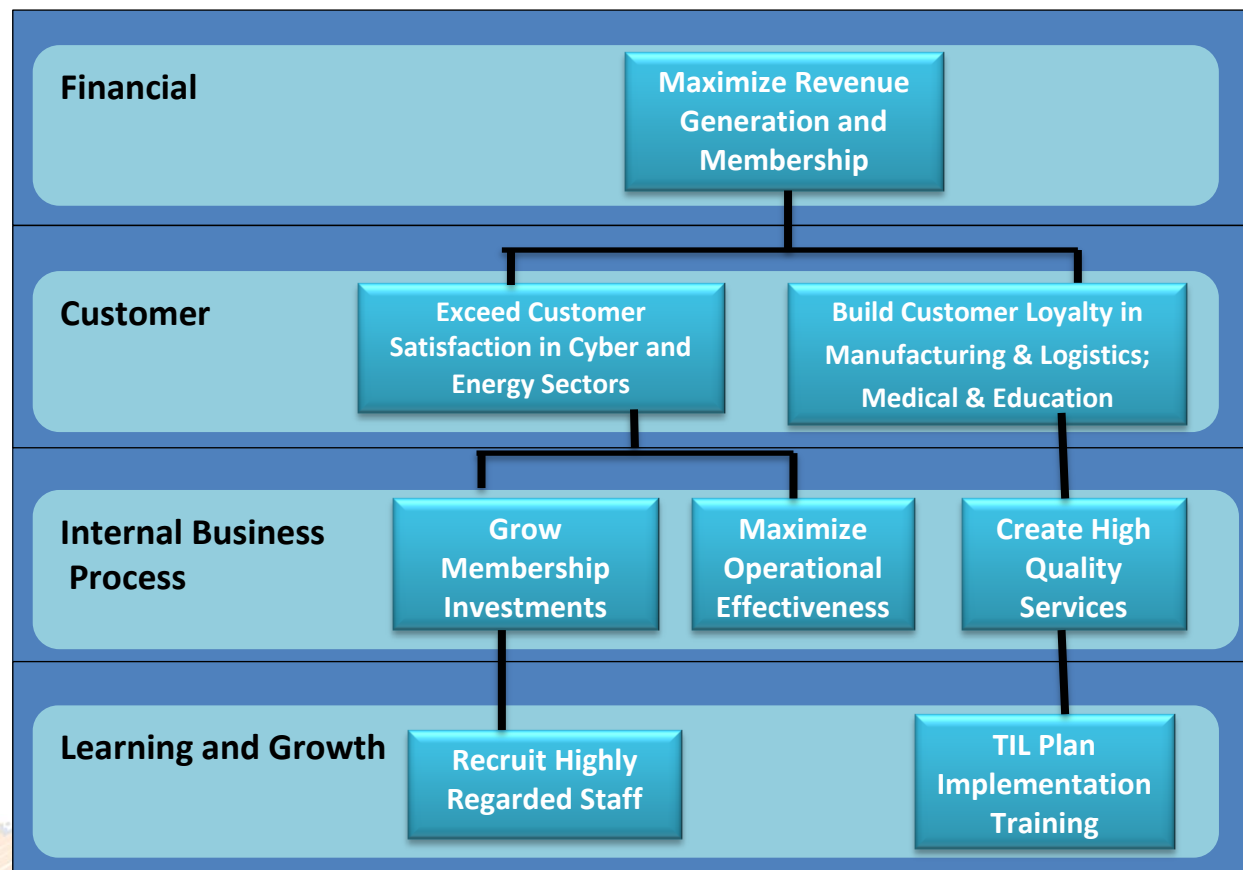
Hampton Roads that benefit from the wealth creation and workforce impacts on the region and on the Commonwealth, and 6) regional organizations and businesses.

The Values

TIL's mission requires that it create value for its customers and its stakeholders. Value is created by offering a product or service that the customer needs. In fast-moving technology markets, the value of a project or a process is often in a continual state of change. The value chain for TIL is the sum of all the processes and outcomes that add to the satisfaction of the customer. Some aspects of the value chain are measure internally within the TIL Group and other factors stem from customers, suppliers and other channel alliances. The activities along the value chain are referred to as linkages. These linkages are central to the performance of the TIL Groups successes. Linkages are intersections of critical people and processes that add to the momentum of the mission critical operations for the organization, the customers, and the suppliers.

Management and Measurement

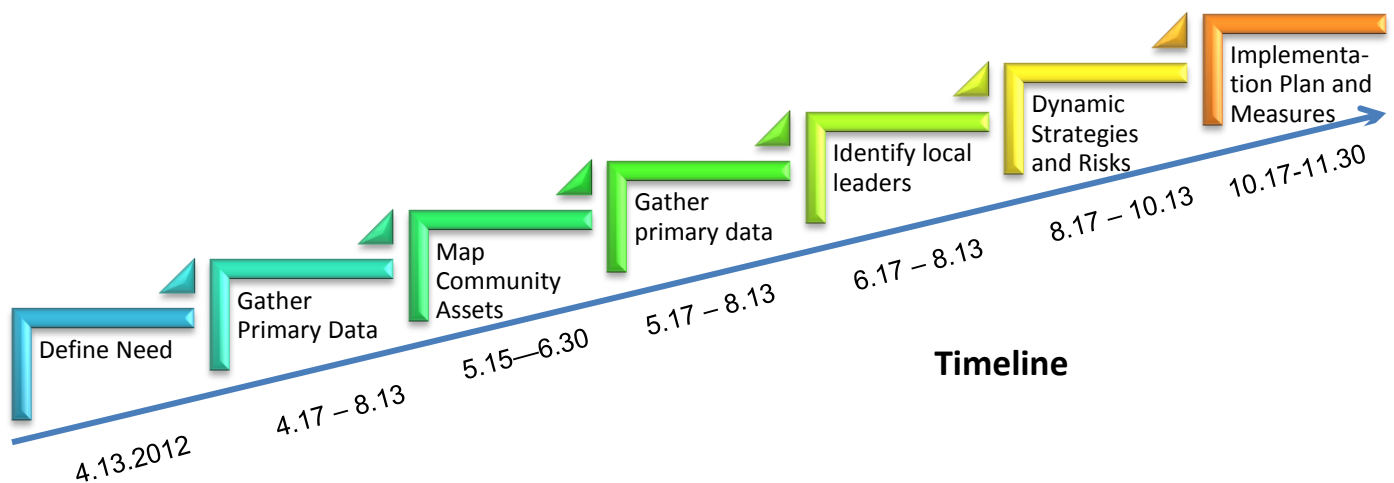
The strategy map is a way of displaying the primary strategic goals for the TIL Group management team. It is associated with the key metrics driving the successful mission to reengineer the talent pipeline and business climate to support M&S-enabled job creation. The business processes are embedded in the strategy map with the need for financial development positioned at the top in the hierarchical view of the TIL plan and mission. Later in the TIL strategic plan, the sub processes, with objectives, metrics, and resources are provided in more granular detailed tables.



Source: Chmura Economics & Analytics

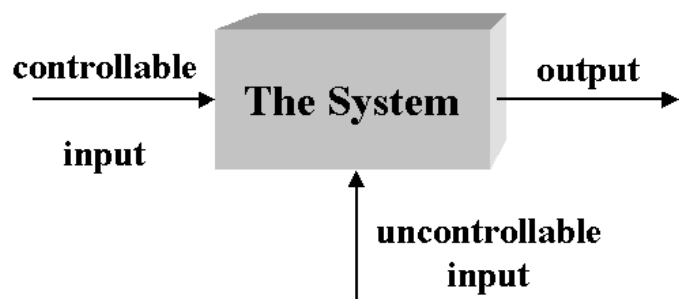
TIL is organized around three key business owners whose job description represents the process they oversee in the execution of the mission. These key players are 1) Chief Transformation Officer, 2) Market Position Coach, and 3) Chief Operations Officer. It is suggested that the legal structure for the TIL Group begins as a 501 (c) 3 for 2013–2015 (18-months). The legal structure seeks to become a limited liability corporation (LLC) over the operating period of 2015–2017. The goal for TIL is to grow revenues from 1) increasing market share, 2) creating value for the customers and investors, 3) aligning resources and talent with the goals of the member organizations and the employee stock owners. The TIL Group, if successful, may seek to spin-off the organization or position as a joint venture. The mission statement calls for public-private strategies that guide the first 18-months of implementation. After the LLC is formed, the strategic mission will shift to one that is driven by customer satisfaction and increasing market share. It is important that the public strategies continue to link to the TIL Group in terms of having a deeply aligned education pipeline and local policies that foster life-long learning of M&S engineers and software developers' ecosystems.

The TIL Group Strategic Planning Process



Strategic Overview

The concept around M&S is to pretend that one deals with a real thing while really working with an imitation.¹ This orientation within the market place allows businesses to make products cheaper, better, and faster. Systems that are omnidirectional (dynamic) with a degree of randomness are good candidates for M&S process design. M&S applications allow models to deal with uncertainties through the application of mathematical rules and statistical analysis of the processes that are central to an organization's



¹ <http://home.ubalt.edu/ntsbarsh/simulation/sim.htm#rintroduction>

profitability. M&S models include the variables for a stochastic process that include time (continuous and discrete) and change in the steady state (baseline) of the system.²

Market applications are found where business process improvement is focused on process optimization while others are goal-seekers. In Hampton Roads, M&S enables the DoD to train its personnel for strategic and coordinated combat scenarios. M&S is applied to building aircraft carriers and refitting nuclear submarines at Newport News Shipbuilding. NASA Langley uses M&S applications that are physics-based all the way up to systems-based. Consequently, the region's M&S brand has reached international recognition as a world-class source for M&S solutions. M&S is now poised to be the next technology to enable greater productivity and competitiveness for most industries

The Business Case for Change

The TIL business model is one of an accelerator for companies want to acquire new customers outside the federal



government and generate revenues; TIL helps match these clients with investors and provides access to brand and technology partners. Public-private strategies (years 1-2 of the plan) can be developed to help M&S firms and talent turnaround from DoD dependencies toward the free market for new business development. With the loss of JFCOM, the region has lost its largest customer for the M&S workers still living in the area. The strategies to reapply these workers into new markets impact workforce,

economic, and education assets in Hampton Roads. The JFCOM M&S downsizing left a surplus of M&S knowledge workers in Hampton Roads, which in turn, created a strong economic development engine for attracting and expanding the industry base. The TIL strategic plan lays out a roadmap for moving the M&S technologies, employers, and workers to a global market-leadership position through effective leadership, innovation, and new investments in the M&S assets in Hampton Roads. *The Transforming through Innovative Leadership* (TIL) strategic plan is designed to move people and productivity from the 'as is' market focus within government sectors to the 'should be' commercial markets. This single strategy has a number of specific goals and objectives that drive the dynamics of the TIL plan, including the risks and rewards of decision analysis.

Design of the Strategic Plan

The strategic plan has two action areas—one guides the internal actions of its owner, and the other guides the external actions specific to its market focus areas. The internal strategies are laid out first with an emphasis on

² <http://home.ubalt.edu/ntsbarsh/simulation/sim.htm#rintroduction>

financing the strategic plan's implementation. The externalization of the plan brings together both the public and private sectors into six market challenge areas for the first 2-years of the plan's life cycle. The market challenge areas encompass cyber and energy, manufacturing and logistics, and education and health/medical. The last 3-years of the plan is focused on moving the TIL group away from 501 (c) 3 status to a legal structure as a for-profit entity.

The plan is also designed to position change agents as collaborative teams between M&S core and applied industries that employ subject matter experts (SMEs) and potential future private-sector firms that can benefit from M&S technologies. It is a dynamic plan by design that allows for implementing strategies that factor in risks and probabilities around marketplace uncertainties.

Vision: To be the internationally-recognized market leader for M&S solutions supporting world-class businesses and workers. *(What we want from the desired future state.)*

Mission: TIL seeks public-private strategies to reengineer the talent pipeline and business climate to support M&S-enabled job creation. To accomplish its goals, the change agents seek to work collaboratively with education, SMEs, and businesses to foster innovative opportunities in economic and workforce development. *(How we operate in the current state to achieve our mission.)*

Strategic Intent: To focus on three areas of shared risk. The TIL plan seeks to move its M&S assets to a best in class standard by demonstrating a real-world business case for reducing costs through M&S solutions. This demonstration will 1) foster M&S core firms to enter new markets through innovative business models while focusing on existing and new customers as well as new markets, 2) grow a developer ecosystem by investing in lifelong training for M&S SMEs, and 3) advocate through public policies and collaborative public and private strategies how to create an environment that makes it easier/faster for businesses to adopt M&S applications across multiple enterprises.

Vision, mission, and strategic intent focus TIL on a single strategy—turnaround from DoD to free markets.



Key Values for the TIL Team

- **Achievement**—supporting transformation toward vision and goals
- **Collaboration**—fostering entrepreneurial environment to advance M&S technologies in private-sector markets
- **Honesty**—centering our efforts on sound business ethics and practices
- **Innovation**—creating competitive advantages for our customers
- **Integrity**—adhering to world-class excellence based on the highest standards for organizational excellence

Challenges to Complete the TIL Mission

Hampton Road's M&S's historical focus on JFCOM was valuable for differentiating the Hampton Roads M&S brand as a center of excellence in serious gaming. The region has achieved excellence in team-based intelligence.



However, to move the region to a commercial market leadership position requires a shift in thinking about the current state of DoD-dependency to one of shared risk with private sector firms. The execution and delivery of the mission into diversification away from DoD requires clear education about future markets, the cost to enter new markets, and the capital and tools available to help make the transition successful.

There are three major challenges to deploy the mission. The first is successfully identifying the owner of the strategic plan that is responsible for its success. The placement of the TIL ought to be one of sustainability. The leadership of the TIL is vital to the success of the plan's intended outcomes. The second challenge is one of technology adoption. The current DoD-centric business model creates certain fiscal challenges around understanding the real return on investment (ROI) from M&S as a process improvement strategy for private sector firms. The marketing message must be clear and point to real world solutions. The change agent needs to help communicate barriers to entry models that include cost avoidance savings as well as ROI. Lastly, the integration of the TIL plan into the decision support structure and culture of Hampton Roads will require strategic investments in staff development and asset reinvestment.

Organizational Response to Challenges

Chmura recommends that the structure for the TIL Group be one of employee-owned equity, but only after the TIL plan has achieved the key milestones for the first 18 months as laid out in the TIL plan. The first two years are funded through to-be-determined funds. This hybrid approach allows for seed funds to mobilize the right talent to own and implement the plan while simultaneously operating as entrepreneurs. The turnaround management capabilities for the TIL Group need to be part of the experience of the team acting as change agents for M&S in Hampton Roads. Chmura suggests these change agents be financially successful, philanthropic, and looking for a significant project to focus on for five years. The tactical role of the TIL Group is that of matchmaker—businesses seeking M&S solutions to the TIL membership companies doing business in Hampton Roads.

Revenue Generation Business Model

The revenue-generation strategy is vital to the success of the mission. Unless TIL gains the public-private support in the first 18 months (2013—2015), the TIL Group will fall short of its strategic intent to serve customers either because of insufficient funding development or due to strategic misalignment to new market access. It is the view of Chmura, that if the TIL Group cannot be exclusively entrepreneurial in structure and in mission, the vision for the M&S sector in Hampton Roads cannot thrive beyond where it is today at the accelerated pace the Governor's M&S Advisory Council is seeking. With much uncertainty in the federal budget, particularly with defense spending, the future growth of DoD dependent M&S is expected to slow and even contract under federal sequestration in 2013. With that as a backdrop, the legal structure and the revenue-creating arm of the TIL plan is aimed at increasing revenues in two ways: 1) through **core M&S business membership in the TIL Group, LLC**, and/or 2) through a **fee-based approach for any business** seeking M&S supply chain management and consulting services to take on the technology solutions from M&S in some dimension of their business model. The fee-based approach applies to all industries not core to M&S, including the allied M&S cluster-based industries located in Hampton Roads.



The membership tiered approach is available at three investment levels on an annual basis. Business members can invest into the model by purchasing stock through membership fees. Chmura recommends 3 levels of buy-in for the M&S business members in Hampton Roads.

1. Theatre membership—\$50,000 annually
2. Gallery membership—\$25,000 annually
3. Event membership—\$2,500 annually

Theatre Level

This investment is by far the most comprehensive, carries the greatest risk, and offers the maximum reward. The theatre-level member has one seat on the TIL Advisory Board. They also have government and oversight authority over the business, market, and operations plans for the TIL Group. Theatre level is akin to blue chip stock holders. They have voting power on resource allocations, staffing, and they form management teams that subsequently define the objectives plus the measures and targets associated with the objectives of the TIL strategic plan. Theatre-level members are the voice of TIL to the resources listed in the strategic plan. They have a seat at any meeting at the Governor-level, they meet with lobbyist, they influence the marketing message and the operations plans.

The \$50,000 annual membership gives the Theatre-level member companies an opportunity to invest in M&S portfolios and receive annual dividend payments and stock-options based on the growth in revenues by the TIL Group.

Gallery Level

This level of investment is significant, carries less risk than the Theatre Level, and provides medium-valued benefits compared to the Theatre Level. A Gallery member has the same access to the management and operations of the TIL Group, at a lower investment cost.

Event Level

This type of membership is available to any business that wants to attend capital-access events. These events are described in the plan as ‘mash-ups’, forums with venture capital and venture capital development, ‘shark tank’ events. The annual fee allows these members to have access to potential customers and investors. Event level memberships do not own stock and do not receive dividend payments.

Other Revenue Streams

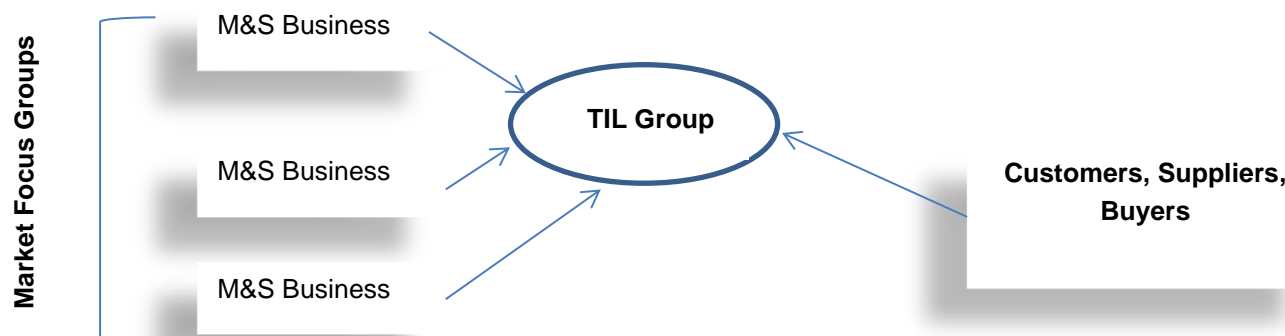
The TIL Group can collect consulting fees from non-core M&S businesses seeking M&S technology solutions. TIL Group will have the talent and the staff to provide consulting fees for:

- Supply chain management services
- Writing proposals
- Educating potential clients about how to position M&S solutions for increased efficiencies
- Estimating costs to bring in M&S solutions
- Enterprise-level services and change management services
- Forecasting return on investment and cost avoidance projections
- Writing grant applications
- National and international market analysis



- Business process improvement analysis

The business model for the first two years is based on securing revenues from a few different sources to get the plan implemented. During its first two years of operation, the TIL Group will be receiving fees from businesses that want to buy-in to the model.³ The TIL Group will help its member businesses find new customers. The TIL



Source: Chmura Economics & Analytics

Group will identify the best markets that align to the tools, solutions, and SMEs embodied in the member companies. After two years, the TIL Group will take 100% ownership of the equity assets from the first 18 months of the TIL strategic plan's implementation. The core staff is self-funded and the equity is shared among the TIL employees as stock ownership.

Change Agent Staff Needs (Internal Strategies)

TIL Group will provide the decision support and leadership needed to implement the plan. The TIL is recommended to staff up to at least three positions with the following roles:

- **Chief Transformation Officer (CTO):** creates the organization; leader of the change management teams; the reengineering expert for M&S core and M&S allied business development. CTO owns risks and rewards to the strategy dimensions in market challenge focus areas. This person needs to have experience at the CEO level with a business development background. This individual needs to have turnaround vision.
- **Market Position Coach (MPC):** makes the business case for talent development in the M&S talent pipeline. MPC is the leader in human capital development and the process owner for the marketing plan. The MPC needs to be a turnaround expert.
- **Chief Operations Officer (COO):** owns the change management process and the implementation plan; COO leads the coordination of the implementation phases to the market focus groups (MFG), and centers of excellence in the membership. COO owns the spheres of influence across the MFG in M&S core and M&S allied markets. COO needs to have a turnaround sense of urgency.

³ Chmura suggests annual fees represent shares of equity that are paid back at the sale of the TIL Group.

Organic Strategic Planning is a Process

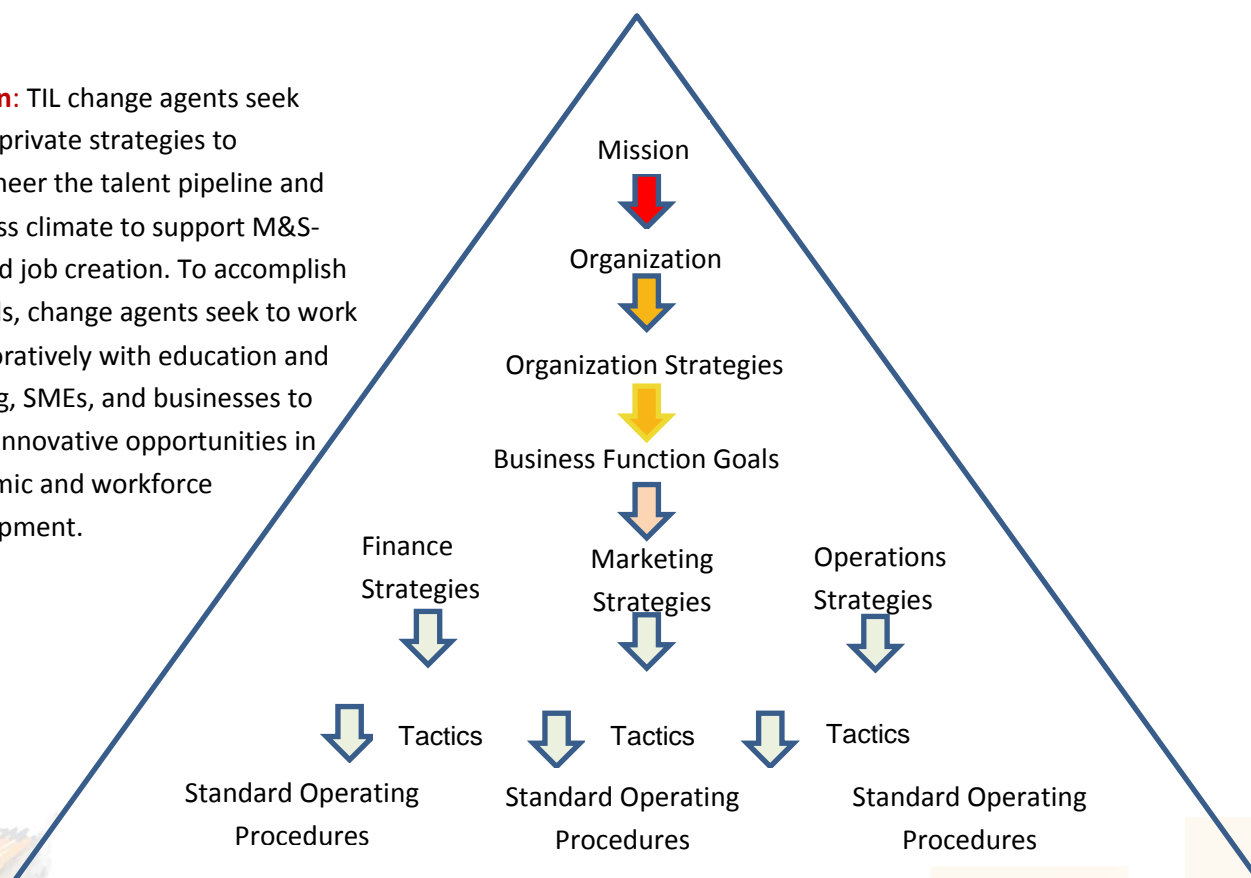
Planning and decision-making are typically hierarchical for most organizations. Part of the design of the TIL plan is to help identify the change agent for the successful implementation of the strategic plan's desired outcomes. The TIL plan has been designed for the Virginia Governor's M&S Advisory Council to provide governance and oversight for a coalition of public and private strategists to execute the plan. The plan is flexible so that it can be integrated into an existing public or private structure in the Commonwealth such as the Virginia Economic Development Partnership (VEDP). Alternatively, TIL can operate as a subsidiary of the Hampton Roads Partnership or it can stand, as Chmura proposed, as a foundation strategy for a newly formed, standalone entity made up of the three key staff plus an administrative/accounting person.

The mission of the TIL plan is designed to integrate workforce planning with local economic development goals of diversifying M&S markets and to engage the K-20 pipeline to optimize curriculum delivery that aligns with vision for Hampton Roads to achieve world-class recognition.

How the TIL Mission is a Turnaround Strategy

Process owners drive the strategic dimensions of the mission by linking their goals across the finance, marketing, and operations arms of the organization (inward) and then to crosslink these mission-critical functions with the strategies for reaching the market-based targets (outward). The figure below shows how the functional and tactical arms of the plan emanate from a mission-critical top-down approach. Market leadership positioning is part of the desired future-state from the full deployment of the mission.

Mission: TIL change agents seek public-private strategies to reengineer the talent pipeline and business climate to support M&S-enabled job creation. To accomplish its goals, change agents seek to work collaboratively with education and training, SMEs, and businesses to foster innovative opportunities in economic and workforce development.



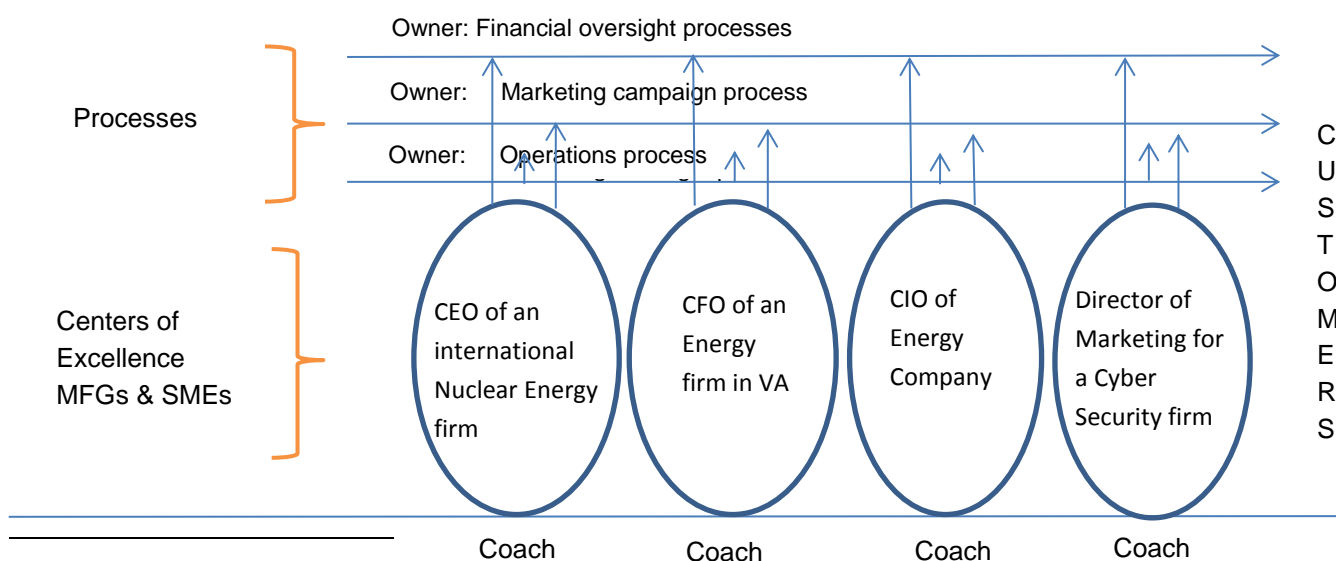
Organizational Strategies

The implementation teams for the strategic plan were identified through a process of interviews, surveys to M&S core and allied industries, and SMEs. From the FusionEQ survey instrument, the degree of interconnectedness between the stakeholders was mapped and the participants with the most connections were migrated to the InsidersEQ cloud. Within this framework, virtual focus group discussions occurred. From these discussions, key stakeholders emerged as good fits for cross-functional plan implementation. The stakeholders have shared centers of knowledge and excellence, and they have strategic dimensional focus to implement a portion of the strategy map over which they have a sphere of influence.

A process-centered organizational design is recommended for the implementation teams that will take TIL and make it actionable. Three key players are recommended for the management of the transformational strategies presented in this report in order to be successful in Hampton Roads—three process owners (CTO, MPC, and COO) drive the mission to completion by focusing on 1) securing funds for sustainability, 2) perfecting the message to the markets, and 3) aligning SMEs, businesses, and stakeholders to focus on the full implementation of the plan. Together, this team can provide ‘front line’ services to the customers and 360-degree feedback to the Governor’s M&S Advisory Council, the TIL members, and the business development community.

Business Function Goals

In order to implement a sequenced set of strategies, the organizers for changing the business model in M&S must understand the processes that guide change as well as the players that can impact meaningful change. The approach taken here was to group the stakeholder group and the TIL Group into the MFG. The MFGs have centers of excellence around the key business functions of the organization making the case for change. By market focus group we mean people in the primary organization that share like centers of excellence (knowledge, skills, and abilities) with SMEs, education, and businesses in M&S. The following schema shows the MFG touch points in the strategic plan⁴ and the talent dimension for the SMEs.



⁴ Michael Hammer. *Beyond Engineering*, 1997.

Identification of the MFGs was carried out in a structured manner through a couple of social media tools—FusionEQ and InsidersEQ as described in Section 3.1.2.1 of the “Modeling and Simulations Hampton Roads” report. FusionEQ was the social media (secure) survey instrument that allowed the visualization of the degrees of connectivity between SMEs in Hampton Roads. From this mapping information, SMEs and MFGs were introduced in the cloud—a virtual focus group for specific-types of strategic discussions.

The analysis of the social networks for the SMEs and MFGs uncovered the leaders in M&S in Hampton Roads. A small sample was selected to be part of a virtual community. The ‘InsidersEQ’ cloud was populated and on-line focus groups were held. Ideas were shared and strategies discussed with experts that possess market and workforce connections.



SWOT

With the mission of job creation through private sector market access, the TIL plan considers the strengths, weaknesses, opportunities, and threats (SWOT) of achieving the goals for the plan. The SWOT analysis is an assessment of the current state of the M&S solutions. The strategic plan is an organic one designed for a change agent to take a leadership role in the transformation of M&S from a DoD-dependent state to one of diversification. Therefore, the SWOT is provided for both the state of the workforce (external scan) as well as an assessment of the “energy already established by the Commonwealth and the regional partners to conduct a sector-specific economic and workforce analysis of the Hampton Roads modeling and simulation sector”⁵ as part of an internal scan. Thirdly, we provided a SWOT for Hampton Roads’ climate and capability in an index that takes into account both internal (specific to Hampton Roads) and external (national) climate capabilities. The index methodology is provided in the appendix of “Modeling and Simulations Hampton Roads”.

All three SWOT analyses taken together provide a framework to plan for the desired future state (vision) through a decision analysis process based on trends, irregularities, limitations, and opportunities for M&S-driven job growth. The decision support process is provided at three levels over a five-year timeframe. The TIL plan provides a path to help the change agents think strategically about the policies and practices that both support and roadblock job growth in Hampton Roads. The TIL SWOT synthesized primary and secondary data to provide the baseline of M&S economic activity. From the baseline analysis, the TIL plan benchmarks the infrastructure and capabilities of Hampton Roads’ M&S assets to those assets and capabilities in M&S found in Orlando, Florida and in Huntsville, Alabama.

The three lenses through which the TIL plan views success are

- 1) How is the TIL Group positioned in the Commonwealth and in Hampton Roads to successfully turn around M&S to private market access, including the momentum already in play;
- 2) How is Hampton Roads positioned as a market leader compared to Orlando, Huntsville, and the rest of the state and nation; and
- 3) How are Hampton Roads M&S clusters positioned to export to international markets to ultimately achieve the vision of international market leadership positioning?

⁵ From the RFP document “Analysis of Modeling and Simulation.”



SWOT: Change Agents' Capabilities and Organizational Gaps (Internal Scan)

Opportunities

- The TIL Group can create a business development plan based on a solid economic and workforce baseline for M&S in Virginia
- The CTO must be a strong leader in the M&S community
- The TIL Group can create a marketing communications plan with a strong linkage to STEM education, STEM occupations, and STEM-enabled M&S core and allied industries
- M&S CTO will have a deep understanding of the M&S markets that are best-fit choices based on matching the M&S platform and the size of the target market
- Staff will influence the economic development focus on strategic market challenge areas
- Staff can help economic development think about market access strategies
- Staff can help next-generation policies to foster innovation in Hampton Roads
- Staff can communicate the skills needed in M&S and the new and emerging occupations that are not yet part of the U.S. Labor Statistics taxonomy
- STEM education should begin in 3rd grade
- Joint staff retained maintained a lot of the M&S staff—Hampton Roads will need to produce 137 M&S engineers annually over the next 10 years

Strengths

- The TIL Group's organization and structure is lean and aggressive and had structural drivers for ROI from investors; the employee-ownership makes it attractive for investors in venture capital and from foundations, philanthropies, and venture capitalists located in Hampton Roads that are looking for exemplar projects to invest in
- As a new entity, the change agent organization can have a 'fresh start' on making the business case for change
- The talent in Hampton Roads has world-class excellence in M&S clusters

Weaknesses

- Lack of a business development process for M&S entrepreneurs
- Low 'deal flow' from investors inside and outside Virginia and Hampton Roads
- Lack of understanding market focus concepts
- Lack of a marketing message to inform the markets
- Lack of communications around M&S stocks
- Lack of an accepted industry definition in NAICS
- Lack of information about what components, platforms, libraries, and SMEs are available for sale
- Lack of private sector strategies

Threats

- Potential budget shortfalls in DoD in 2013 may create a shortage of funds to implement TIL in Hampton Roads
- MFGs and SMEs are very important to successful implementation of TIL; TIL market challenges are very dependent on the level of risk to reward
- Need to 'unpack' the components and create a cluster-wide store front
- Need a one-stop-shopping message
- Region and state needs to think in big, powerful, and strategic ways about turning around M&S
- Training is not as strong for currently critical engineering occupations. For example, Aerospace Engineering and Operations Technicians have a 0% training concentration—meaning that programs for these occupations are not available in Hampton Roads. In addition, Electrical Engineers; Electronics Engineers, except Computer; and Aerospace Engineers each have training concentrations between 66% and 75% below the national average

SWOT: Change Agents Capabilities and Organizational Gaps (External Scan)

<p>Opportunities</p> <ul style="list-style-type: none"> • Cyber can help DoD become more efficient in a cloud-based computing environment with M&S and visualization training content deployed across remaining Joint Staff. • Technologies are moving toward systems design away from database enterprise-level support—ideal trend for M&S adoption • M&S visualization components are needed by the energy sector to upgrade their M&S capabilities—Hampton Roads has a good handle on high fidelity visualization through SimIS, Inc. • Hampton Roads Shipbuilding is ready to diversify its portfolio outside nuclear ship repair M&S capabilities and it has an established pipeline of workers that can transition into technology-intensive manufacturing M&S solutions 	<p>Strengths</p> <ul style="list-style-type: none"> • Hampton Roads is strategically different than Orlando and Huntsville, particularly in the area of cyber security and M&S • NASA Langley’s strong broad-spectrum depth of M&S from the physics and molecular side all the way up to the systems design side • Hampton University, ODU, and EVMS have very unique and different visions for M&S than Newport News Shipbuilding, MYMIC, SIMIS • Jefferson Science Associates, LLC as the managing organization for Jefferson Lab (Department of Energy site), is well-positioned to dovetail to energy/defense and cyber security with former JFCOM workforce. TRAX International in Lynchburg has been applying M&S for many years; what it lacks is the visualization piece. John Kenny and Johnny Garcia are in discussions about adding visualization components into their existing M&S tools. This prototype storefront project can provide some skin in the game for the TIL Group. • Workforce needs at the mid-to-low skill are in equilibrium with supply • Hampton Roads has a young workforce: <ul style="list-style-type: none"> ○ 49.6% under 35 years old in Hampton Roads ○ 46.8% in Virginia ○ 47.2% in USA ○ 46.9% in Huntsville ○ 48.3% in Orlando ○ 48.9% in Northern Virginia
<p>Weaknesses</p> <ul style="list-style-type: none"> • M&S SMEs have worked in DoD supporting roles so long they don’t have a good sense of how to implement effective business 	<p>Threats</p> <ul style="list-style-type: none"> • Workforce needs to foster an ecosystem of developers and M&S engineers

development processes

- Demand continues to exceed supply for M&S (high-skilled) engineers and developers
- Region is too dependent on DoD for billable hours and resources are scarce to develop non-DoD contracts
- Population growth (average annual 2000-10) lags the state, the nation, and the peer regions in population growth
 - Hampton Roads 0.5%
 - Virginia 1.2%
 - USA 0.9%
 - Huntsville 1.8%
 - Orlando 2.3%
 - Northern Virginia 1.9%

- K-12 Education not yet embraced M&S curriculum slowing the adoption of M&S curriculum as curriculum
- Paradigm shift in culture from DoD to private commercial space
- Educational attainment (defined as having a bachelor's degree or higher) in Hampton Roads is below the national average:
 - 27.7% in Hampton Roads
 - 33.8% in Virginia
 - 27.9% in USA
 - 34.1% in Huntsville
 - 27.9% in Orlando
 - 51.7% in Northern Virginia

The climate-capability matrix presented in this report analyzes 60 of the 64 industries examined by Chmura Economics & Analytics for CIT in 2011.⁶ The initial 64 industries analyzed for CIT were selected based on Virginia General Assembly House Bill (HB) 2324, regional technology council input into the Commonwealth Innovation Index, and the industry priorities of the Virginia Economic Development Partnership.⁷ HB2324 charges the Innovation and Entrepreneurship Investment Authority (IEIA) with identifying "research areas worthy of economic development and institutional focus."⁸ The Commonwealth Research Commercialization Fund (CRCF) was allocated \$6 million in FY 2012 and \$4.8 million in both FY 2013 and FY 2014. CRCF awards seek to "enhance economic development through technology and research commercialization."⁹ Chmura incorporates the climate-capability matrix into our M&S analysis as there is overlap between research-intensive industries in Virginia and modeling and simulation, and funding from CRCF can be tapped to develop M&S capabilities.

⁶ Four industries were not analyzed for the purposes of this report because they did not have reported employment in the region.

⁷ Research and technology areas eligible include: Advanced Manufacturing, Aerospace, Communications, Cyber Security, Energy, Environment, Information Technology, Life Sciences, Modeling & Simulation, Nuclear Physics, and Transportation. <http://www.cit.org/service-lines/research-and-technology-strategic-roadmap/>

⁸ The mission of the IEIA is to accelerate the next generation of technology and technology companies to make Virginia an attractive business location.

⁹ <http://www.cit.org/service-lines/commonwealth-research-commercialization-fund/>

M&S Core and Allied Climate-Capability Matrix¹⁰

Opportunities (Favorable Climate/Weak Capabilities)

- Most favorable climate
 - Communications Equipment Manufacturing
 - Pharmaceutical and Medicine Manufacturing
 - Semiconductor and Other Electronic Component Manufacturing
- 7.6% of all occupations or 635 jobs in the favorable/weak quadrant are STEM in Hampton Roads
- 10-year STEM replacement and growth demand of 133 and 940 jobs, respectively, with 10-year total STEM demand of 1,037 jobs
- Favorable mix to focus on markets outside Hampton Roads

Strengths (Favorable Climate/Strong Capabilities)

- Most favorable climate:
 - Ship and Boat Building
 - Management, Scientific, and Technical Consulting Services
 - Architectural, Engineering and Related Services
- 32.5% of all occupations or 23,978 jobs in the favorable/strong climate quadrant are STEM in Hampton Roads
- 10-year STEM replacement and growth demand 5,309 and 6,146 jobs, respectively, with 10-year STEM demand of 11,455 jobs
- Favorable mix for market focus on new customers/new markets in aerospace and cyber security

Weaknesses (Less favorable Climate/Weak Capabilities)

- Weaknesses are not relevant to this index.

Threats (Less Favorable Climate/Strong Capabilities)

- 7.2% off all occupations or 2,290 jobs in the less favorable/strong climate quadrant are STEM in Hampton Roads
- 10-year STEM replacement and growth demand of 444 and 132 jobs, respectively, with 10-year total STEM demand of 576
- Favorable mix for market focus on new customers/new markets

The SWOT for the climate-capability matrix is designed to consider STEM as an enabler in M&S. This is the foundation for the STEM education pathways strategies to be expanded on in the strategy design section. The traditional SWOT is also provided below to take into account an internal scan for the TIL owners and the gaps that exist in the organizational structure as part of the external view of the owners implementing the TIL strategic plan.

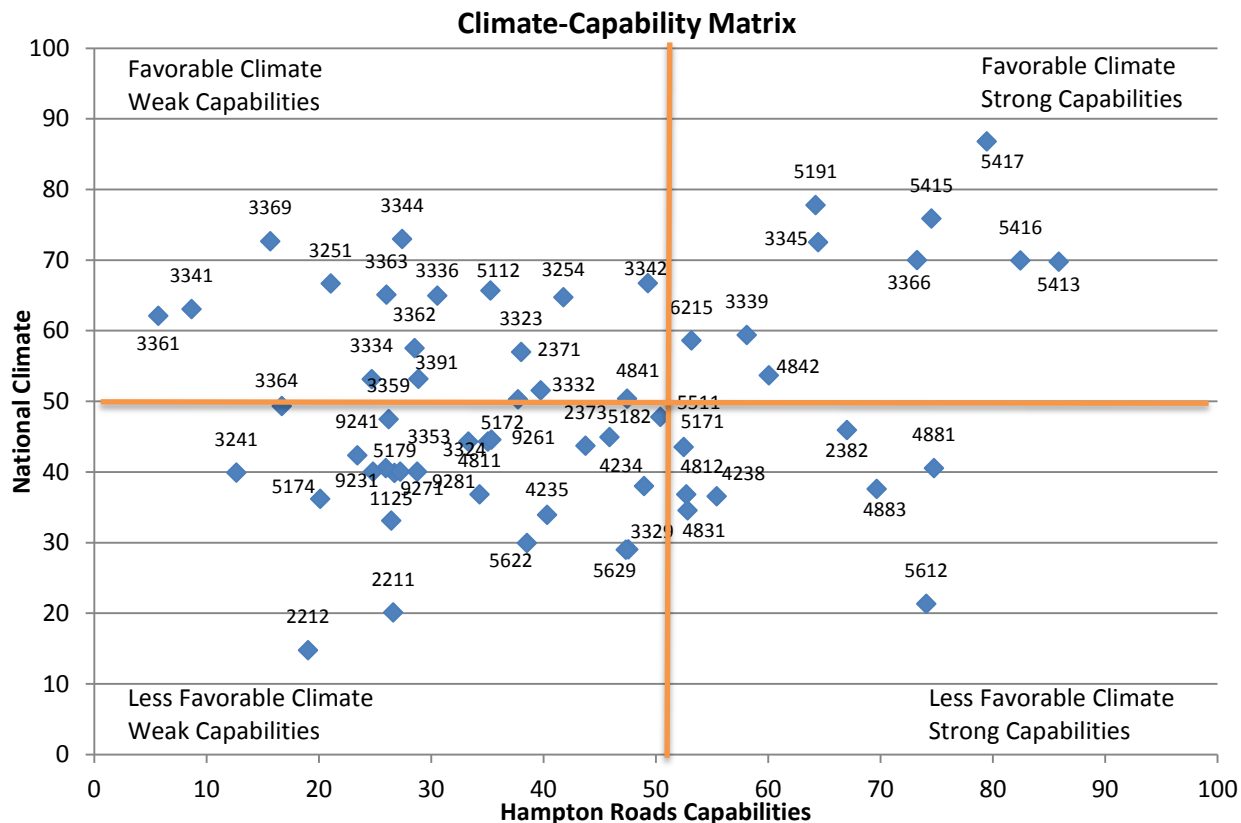
¹⁰ Methodology is provided in the Appendix.

Favorable U.S. Climate and Low Hampton Roads Capability

2371 Utility System Construction
3251 Basic Chemical Manufacturing
3254 Pharmaceutical and Medicine Manufacturing
3323 Architectural and Structural Metals Manufacturing
3332 Industrial Machinery Manufacturing
3334 HVAC and Commercial Refrigeration Equipment Manufacturing
3336 Engine, Turbine, and Power Transmission Equipment
3341 Computer and Peripheral Equipment Manufacturing
3342 Communications Equipment Manufacturing
3344 Semiconductor and Other Electronic Component Manufacturing
3361 Motor Vehicle Manufacturing
3362 Motor Vehicle Body and Trailer Manufacturing
3363 Motor Vehicle Parts Manufacturing
3369 Other Transportation Equipment Manufacturing
3391 Medical Equipment and Supplies Manufacturing
4841 General Freight Trucking
5112 Software Publishers

Favorable U.S. and High Hampton Roads Capability

3339 Other General Purpose Machinery Manufacturing
3345 Navigational, Measuring, Electromedical, and Control Instruments Manufacturing
3366 Ship and Boat Building
4842 Specialized Freight Trucking
5191 Internet Publishing and Broadcasting (NAICS 2002)
5413 Architectural, Engineering, and Related Services
5415 Computer Systems Design and Related Services
5416 Management, Scientific, and Technical Consulting Services
5417 Scientific R&D Services
6215 Medical and Diagnostic Laboratories



Less Favorable U.S. and High Hampton Roads Capability

2382 Building Equipment Contractors
4238 Machinery, Equipment, and Supplies Merchant Wholesalers
4812 Nonscheduled Air Transportation
4831 Deep Sea, Coastal, and Great Lakes Water Transportation
4881 Support Activities for Air Transportation
4883 Support Activities for Water Transportation
5171 Wired Telecommunications Carriers
5511 Management of Companies and Enterprises
5612 Facilities Support Services

Market Challenge Sectors and Possible Future Scenarios

The strategic plan has three decision support levels that will be implemented over five years. The risks and probabilities increase with each level.

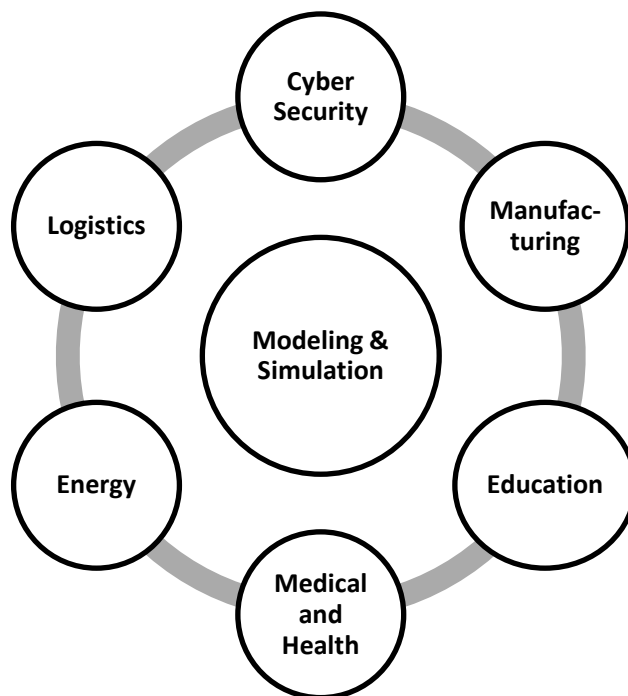
- Level 1: Reengineering Joint Staff (displaced workers) by shifting capacity to the energy sector and cyber security (18 months) as mission is repurposed
- Level 2: Intensify the M&S application in the industry, expanding to other manufacturing and logistics sectors (2 years)
- Level 3: Intensify M&S applications in health care and education sectors (5 years)

Risks and rewards are presented over the strategy dimensions for the change agents by the following. Risks and rewards increase from the top to the bottom of the list.

Risks

1. Existing customer focus
2. New customer focus
3. New market focus

Hampton Roads Market Challenge Focus Areas



Strategy Dimensions

- Intensification
- Improve processes to existing customers
- Extension
- Use a process to enter new markets
- Augmentation
- Expand process to provide additional services
- Conversion
- Take what you do well and provide it to a new customer
- Innovation
- Apply what you do well to create new revenues

Risks

The market place potentially has needs in seven areas where modeling and simulation outputs can solve real-world problems. A brief description for each market need is provided below with more detailed analysis to follow:



1. Cyber Security (reengineering JFCOM through M&S to improve training with reduced resources). The majority of cyber security is done in Hampton Roads.
2. Technology-Intensive Manufacturing (increase the pipeline of workers and trainees with stochastic modeling skills for technology intensive manufacturing already in the region)
3. Education (M&S in curriculum as curriculum)
4. Medical (combining systems dynamics models with discrete-event simulation models reduces the “not invented here” syndrome)
5. Energy (incentivize private sector to improve investments in energy and defense)
6. Logistics (improve port security through M&S predictive modeling capabilities)

Risks and Rewards: Which Strategies Do We Implement and Why?

Understand strategy implementation against possible future scenarios means apply risks to understand rewards and probabilities of success. The risks look at strategy dimensions such as:

- 1) Technical—what technologies do the M&S macro economies support?
- 2) Economic—how much money should be spent to regain M&S workers? How much has been invested-to-date and what are the results, if any?
- 3) Social—how much do the people of Hampton Roads and Virginia care about M&S jobs? To what extent does intervention take place to reinvent M&S to attract new investments? What do these investments need to look like and what are the risks over time?

Real Options

- 1) What is the fastest way (fewer risks/lower barriers) to grow M&S jobs to meet the mission (current state)?
- 2) What technology or process solutions are needed in the marketplace to improve companies’ efficiencies?
- 3) What solutions and business models are in the market place that can benefit from having M&S as part of their long-term competitive advantage?

Estimating Probabilities

Assumptions and background: Get a reasonable concept of the range of possible outcomes. This is needed because the SMEs are demonstrably overconfident in their assessments. They are reluctant to admit how different the reality may be from their forecasts. Need some wide-range knowledgeable SMEs with established clients.

Key issues: 1) Demand for the current ‘state of the art’ of the products and 2) Demand for the SMEs and data analysis skills vs. M&S technologies (products vs. services).

Decision Analysis

The remainder of this document contains the goals and objectives, the strategies for the marketing communications plan, key metrics and indicators for success, and the decision support analysis for selecting the markets to focus the turnaround strategies to fulfill the mission. The plan is designed to be flexible; given the uncertainties with the national health care program and the fiscal cliff scheduled for December 31st 2012. If the



Budget Control Act of 2011 is not altered, the nation and Virginia will likely be in a recession during the first half of 2013. Therefore, the TIL is dynamic in that the TIL Group can do scenario planning by changing the risks in each of the market challenge areas.

The tables in the following trifold sections represent the fully integrated plan which allows the TIL Group to understand the dimensions of the plan's 3-lens view:

1. The TIL Group. Designed to be entrepreneurial with full employee ownership in two years.
2. The TIL Plan. The strategies deployed to achieve the mission leading to the desired future state.
3. The role of the Commonwealth and the Hampton Roads stakeholders in the first 24 months prior to employee-owned equity.

The tables provide the details of the objectives that support each goal and the role of the TIL Group in successful goal actualization. The tables provide a linear view of the decision support process in three levels of support over a five-year timeline.

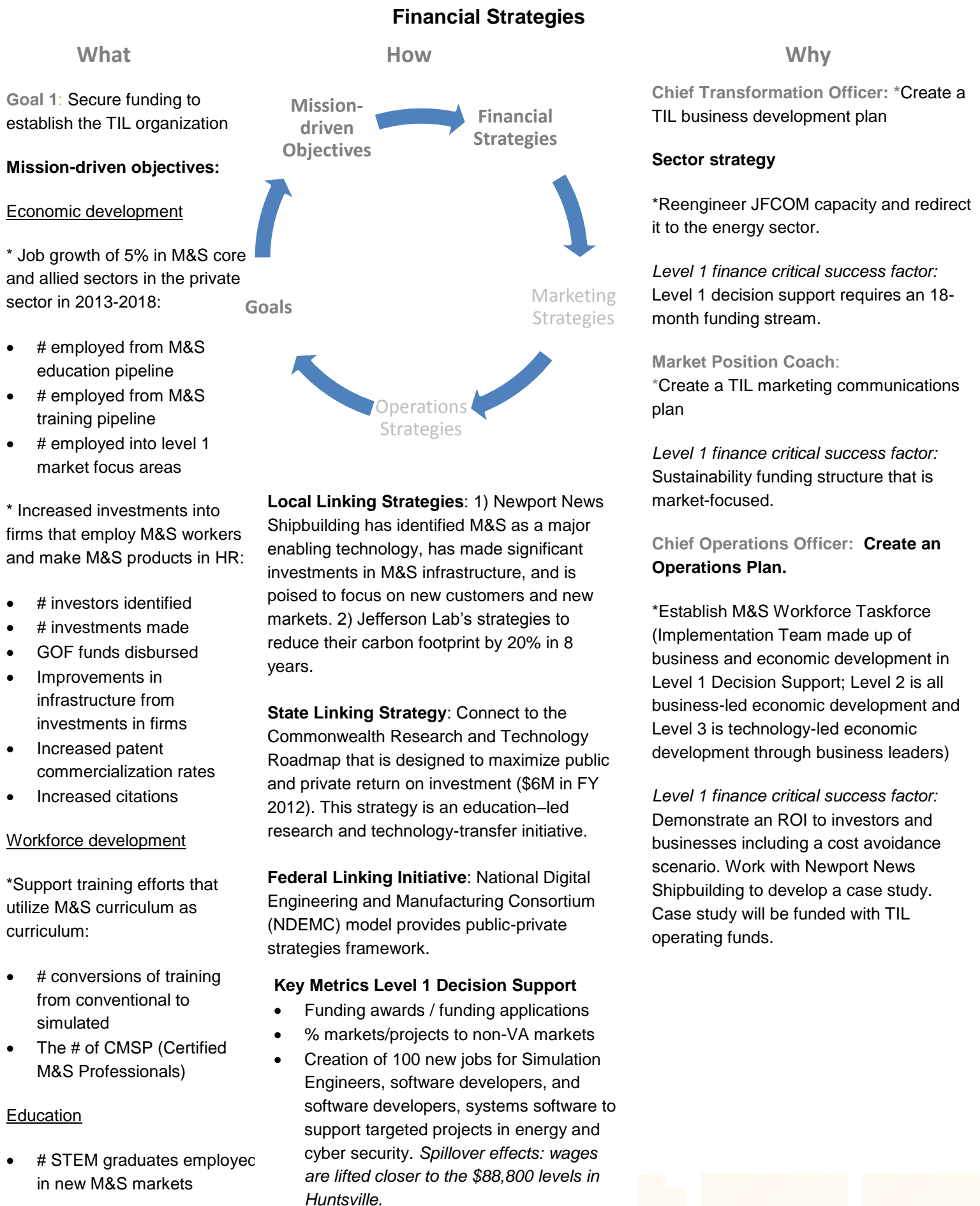
Dynamic Strategic Planning Portal

Chmura understands that in the current economic environment, a dynamic approach is required to shift levels of decision support as uncertainties shift and markets adjust to change. As a result, Chmura created a web-enable tool for guiding the stewards of the TIL plan over the next five years.

The M&S dynamic strategic planning portal is a tool that helps policy makers (TIL team) to evaluate the risks and rewards of a potential strategy. For rewards, the plan involves itemized benefits of the strategy including strengthening the existing customer base, expanding markets to new customers and new geographical areas, innovation, as well as other benefits specific to each industry. For risks and barriers, it itemized the risks that could prevent the strategy from being successful, such as lack of financial resource, lack of workforce, as well as lack of market access. The listed rewards and risks are expandable, in a way that TIL team makers can add additional risk and reward items to the strategic plan.

Each risk and reward factor is assigned a score—high, medium, low, or neutral. Those scores should be assigned based on inputs from the TIL team, industry and academic experts, and state and local governments officials. The sum of total reward points minus risk points are the final score of the strategy.

The plan is dynamic in the sense that it gives TIL flexibility in adding and subtracting different risk and reward factors. Also, it is dynamic because those scores should be re-evaluated periodically as economic and fiscal conditions change.



Scrub the Budget: Public-Private Strategies to Fuel Market Turnaround

Goal #1: Reengineering JFCOM capacity to extend to energy and cyber sectors

1.1 Objectives:	Actions/Requirements	Timeline	Lead	Strategies	Measures	Resources
<i>Establish TIL organization</i>	1. Review state budget	Q4 2012	CTO	1. Position TIL as a change agent for HR and for M&S in the Commonwealth	• Funding awards/applications	TIL MPC, Chairman of the TIL Board, Chair to Governor's M&S Advisory Council,
<i>1.1.1 Create a business plan</i>	2. Apply for federal, state, and local grants for displaced workers from defense cuts	Q4 2012 (18 months)	MPC		• Funding for market plan	Secretary of Commerce and Trade, Secretary of Education, Secretary of Homeland Security, Secretary of Technology, Hampton Performs ,VA Performs
<i>1.1.2 Create a market plan</i>	3. Apply for retraining funds from DOL		COO	2. Communicate innovative ideas for market challenge area to National Digital Engineering and Manufacturing Consortium (NDEMC)	• Funding for operations	VEDP Ex, Director, HR Partnership, business members/stock owners, VA Port Authority, Sentara, Riverside, CCAM, Rolls-Royce, Ft. Lee, DoD, Cyber Expert
<i>1.1.3 Create an operations plan</i>	4. Apply to the Hampton Road Community Foundation for venture capital development assistance	Q4 2012 (18 months)	MPC		• Secure levels 2 & 3 decision-support funds	
	5. Partner with philanthropies	Q4 2012	COO		• Expand business participation through membership fee-structure model	
	6. Position projects with EVMS. ODU, and Hampton University that quality for CRCF funds through CIT Roadmap	Q1 2013 (18 months)	COO			
<i>1.2 Deploy Level 1 Sector Strategy</i>	1. Reengineer JFCOM capacity and redirect it to the energy and cyber security	Q1 2012 (18 months)	CTO	1. Position TIL as the public engagement change agent to upgrade the energy infrastructure in HR	• HR reduced carbon footprint with M&S Solutions	
<i>1.3 Develop China initiative</i>	2. Increase exports to bring M&S core and allied industries up to the national level	Q1 2013 (18 months)	CTO	2. Position NAICS 541611 as a target export within VEDP.	• Return employment levels in M&S sectors to 2009 Q2 levels or 1,051 new jobs	
	3. Work with NNS to promote Storefront engineering services with value-added simulation products	Q1 2013 (18 months)		3. Collaborate with Newport News Shipbuilding to create ROI model	• Increase exports for M&S Core & Allied by 30% to the national average	
				4. Bringing the regional export percentage to the		

(components)

national level implies that the M&S export can expand by over 30%, or over \$50 million potential sales.

- In terms of employment, \$50 million increase in exports would translate into additional 366 jobs in the Hampton Road M&S cluster. Adding direct, indirect and induced impact, total jobs supported by increased M&S exports in the region can reach 693.

Marketing Strategies

Why

Goal #2: Market leadership positioning by focusing on other manufacturing and logistics customers Mission-driven objectives:

Economic development

* Job growth of 5% in M&S core and allied sectors in the private sector in 2013-2018:

- # employed from M&S education pipeline
- # employed from M&S training pipeline
- # employed into level 1 market focus areas

* Increased investments into firms that employ M&S workers and make M&S products in HR:

- # investors identified
- # investments made
- GOF funds disbursed
- Improvements in infrastructure from investments in firms
- Increased patent commercialization rates
- Increased citations

Workforce development

*Support training efforts that utilize M&S curriculum as curriculum:

- # conversions of training from conventional to simulated
- The # of CMSP (Certified M&S Professionals)

Education

- # STEM graduates employed in new M&S markets

What



Local Linking Strategy: VMASC as a center of excellence for M&S education. Create a shared initiative between VMASC and Hampton Roads with a focus on an economic development scorecard.

State Linking Initiative: Invest in branding the Commonwealth as the national modeling and simulation leader for standards and testing methods. Connect with CCAM for CIT funds for CRCF funds for members located in HR.

Federal Linking Initiatives: National Digital Engineering and Manufacturing Consortium (NDEMC).

Metrics Level 2 Decision Support

- # of nationally adopted testing standards
- # new customers in manufacturing solutions
- # new customers in logistics solutions
- # new markets in cyber security &

How

Chief Transformation Officer:

*Promote M&S to state government enterprises in order to benchmark common simulation frameworks for in state government. Maintain a leadership role in the technology adoption of M&S into state government operations.

*Promote designating a facility as the pilot for the future home of the national standards and testing laboratory.

Level 2 critical success factor: 100 % employee-owned equity in TIL Group, LLC

Market Position Coach: Refine marketing communications plan to position the HR M&S brand as part of the overall VA M&S brand as a center of excellence.

*Promote STEM pathways and M&S learning environments—physics to systems level learning to the Secretary of Education, SCHEV, and HR-based Workforce training practitioners.

*Identify a text book publishing company that is ready to embrace M&S curriculum—bring market opportunity to TIL business member firm. Consider a public –private partnership with NASA Langley Research

*Provide a technology roadmap that positions M&S as a key enabler at enterprise levels in the Commonwealth.

Chief Operations Officer:

*Implement a change management curriculum designed in M&S format as part of the marketing communications plan.

- Engage a member of the National Modeling and Simulation Coalition to provide cost to bring M&S solutions to advanced and technology intensive manufacturers
- Engage Canon in the discussion.
- Engage CCAM in the initiative.

See It/Do It: Marketing Successes for Business-led Economic Development

Goal #2: Expand market focus to other manufacturing and logistics customers

2.1.Objectives:	Tasks/Activities	Timeline	Lead	Strategies	Measure	Resources
<i>*Obtain LLC status and set up a Board of Directors</i>	1. Provide a technology roadmap that positions M&S as a key enabler at enterprise levels in the Commonwealth.	Q1 2013 (24 months)	MPC	1. Pick an agency that can benefit from M&S (VITA or VDOT) and make this a pilot project for other enterprise level agencies	<ul style="list-style-type: none"> At least 1 enterprise level M&S solution in Virginia state government 	TIL MPC, Chairman of the TIL Board, Chair to Governor's M&S Advisory Council,
<i>2.1.1 Promote interoperability incentives to make it easier/faster for customers to deploy M&S solutions at enterprise levels</i>	2. Promote STEM pathways and M&S learning environments—physics to systems level learning to the Secretary of Education, SCHEV, and HR-based workforce training practitioners. Expand Flexbook adoption for math and engineering in secondary schools.	Q1 2013 (24 months)	MPC	2. M&S technology adoption within state information technology enterprise—state has skin in the game	<ul style="list-style-type: none"> At least 1 logistics project with VDOT Private sector logistics modeling and planning customer 	Secretary of Commerce and Trade, Secretary of Education, Secretary of Homeland Security, Secretary of Technology, Hampton
<i>2.1.2 Foster M&S Platforms in K-12 and higher ED that stimulate STEM skill competencies (M&S curriculum as curriculum)</i>	3. Work with the Secretary of Technology's staff to identify a major enterprise level platform that needs M&S solutions.	Q2 2013 (24 months)	MPC	3. Increase broker fees from new customers by 10% per year	<ul style="list-style-type: none"> # business members from manufacturing and logistics solutions (providers) 	Performs ,VA Performs VEDP Ex, Director, HR Partnership, business members/stock owners, VA Port Authority, Sentara, Riverside, CCAM,
	4. Communicate barriers to invest in M&S solutions in state government	Q1 2013 (24 months)	MPC	4. Increase broker fees from existing customers by 20% per year	<ul style="list-style-type: none"> # members from manufacturing and logistics 	Ft. Lee, DoD, Cyber Expert
		Q2 2013 (24 months)	CTO	5. Intensify the M&S Application in the industry, expanding to other Manufacturing and Logistics sectors		
				6. Promote investment into digital laboratories		
				7. Promote HR as a national center for testing standards		

2.1 Deploy

Level 2 Sector Strategy	5.	Identify a market for M&S components in manufacturing in HR that is ready for investing in M&S to achieve productivity gains	Q2 2013 (24 months)	CTO MPC	<ul style="list-style-type: none"> • 1 manufacturing project resulting in 3% increase in M&S jobs • Demonstration project for marketing campaign • # of nationally adopted testing standards • Increase in funding to support national center for standards and testing • # of state enterprise systems adopting M&S standards
	6.	Promote designating a facility as the pilot for the future home of the national standards and testing laboratory.	Q2 2013 (24 months)		
	7.	Communicate innovative ideas for market challenge areas to NDEMC. Leverage NDEMC to obtain cost data to bring M&S solutions to manufacturing plants.			



Differentiating HR M&S: Accelerating Job Growth through Technology-led Economic Development

Goal #3: Intensify M&S applications in health care and education by focusing on new customers and new markets

3.1.Objectives	Tasks/Activities	Timeline	Lead	Strategies	Resources
Secure funding for TIL Group, LLC	1. Organize mash-up sessions for business, stakeholders, investors, in new medical markets	Q2 2013 (60 months)	CTO	1. # of national standard testing methods published	TIL Group, CTO TIL Group, MPC TIL Group, COO
3.1.1 Market access capital planning project	2. Refine the investment message in the marketing communications plan.	Q3 2013 (60 months)	COO	2. Intensify M&S application in health care and education sector through privatization of M&S textbooks for health and medical education	TIL MPC, Chairman of the TIL Board, Chair to Governor's M&S Advisory Council,
3.1.2 Feasibility study for Joint Venture	3. Organize mash-up session for education markets—coordinate career and technical college summit showcasing new M&S platforms for simulated education training.	Q4 2014 (60 months)	MPC	3. Identify foreign markets for Architecture and Engineering (541330) Management, Scientific, Technical consulting that seek to use M&S solutions in their operations	Secretary of Commerce and Trade, Secretary of Education, Secretary of Homeland Security, Secretary of Technology, Hampton
3.2 Deploy Level 3 sector strategy	4. Feasibility study for Joint Venture with Sentara	Q1 2015 (60 months)	COO	4. Expand education and medical business membership in TIL Group	Performs ,VA Performs
	5. Feasibility study for acquisition/merger in education simulation software		COO	5. Continue to generate more revenue than investments	VEDP Ex, Director, HR Partnership, business members/stock owners, VA Port Authority, Sentara, Riverside, CCAM, Rolls-Royce, Ft. Lee, DoD, Cyber Expert
	6. Feasibility for M&S solutions for Anthem	Q4 2016 (60 months)		6. Diversity R&D investments within business-member company—leverage portfolio to new markets in education and medical/health	
	7. Feasibility for M&S solutions for Sentara and Riverside and the VA				
3.3 Explore Divesture Strategies					

Linking Strategies to the Commonwealth

Modeling and Simulation Vision for the Commonwealth of Virginia is a national leader in modeling and simulation research, education, and of advocating its use in addressing complex, real world problems – including national security issues and global competitiveness needs.

The Commonwealth of Virginia will lead the nation as outlined in the above vision statement, this Council recommends investing in the following areas. Short term investments should be accomplishable within 12 months. The long term investments may be up to four years.

- Invest in modeling and simulation education
 - Short-term investment: investigate topics including modeling and simulation in K-12 for reform of education curriculum and exceed SOL requirements.
 - Long-term investment: Implement modeling and simulation topics in appropriate courses in K-12 education.
- Invest in modeling and simulation research and development
 - *Status: The Commonwealth is currently providing \$1 million over two fiscal years (13 and 14) to promote modeling and simulation and develop programs to expand leadership opportunities, brand the commonwealth as a M&S leader and expand opportunities in education and workforce*
 - Short-term investment: identify the Commonwealth's industrial gaps that could benefit from M&S analysis.
 - Long-term investment: fund universities to address the above identified problems with M&S solutions.
 - Long-term investment: fund programs for the commercialization of M&S research and development.
- Invest in branding the Commonwealth as the national modeling and simulation leader
 - Short-term investment: identify how the Commonwealth is currently promoting M&S from an education, work force development, and economic development perspective.
 - Long-term investment: implement appropriate branding to improve the identification of M&S with the Commonwealth in the above areas.
 - Long-term investment: make the Virginia Modeling and Simulation Center the "Center of Excellence" for modeling and simulation.
- Invest in modeling and simulation economic development through incentives to businesses that have modeling and simulation as a core specialty

- Status: *The Commonwealth is currently developing a “virtual collaborative space” for modeling and simulation to provide companies, universities, government agencies, etc. a place to “gather” and collaborate on mod-sim projects. It will also have space for events, news, posting mod-sim code, requests for proposals, etc. We are partnering with the National Modeling and Simulation Coalition to launch this initiative (which is scheduled for January 2013)*
- Short-term investment: identify any existing incentives and communicate those in the branding literature. Investigate new incentives that could be put in place.
- Long-term investment: Implement the new incentives identified above



Appendix

Index Methodology

An index is created for both the external climate and Hampton Roads capabilities based on data compiled at the four-digit NAICS level. Both the external climate index and Hampton Roads capability index are calculated by first rank ordering each individual component of those indexes. A weight is assigned to each component and a weighted average of the composite index is calculated.¹¹ The index is standardized to be between 1 and 100, with the higher number indicating a more favorable external climate or higher Virginia capabilities. Intersecting those two indexes allows Chmura to identify industries that are in the best position to receive investment because of strong capabilities in Virginia as well as a favorable national and international climate for future growth.

External Climate, United States

National and global trends provide a more favorable climate for some regional industries than for others and it is important to understand this context to determine the capacity for growth of Hampton Roads' research-intensive industries. The external climate represents the potential environment for growth in the nation and internationally. The national outlook for growth in industrial output provides a good indicator of the future market for an industry's goods or services. The export growth trend indicates the market potential from global markets. Data on research spending and venture capital show the innovation potential of current industries, while data on value added and industry multipliers indicate how effective investment in those industries will be in supporting other industries in the nation.

Specifically, the External Climate Index includes:

- Export growth (2001 to 2009),
- Projected national output growth (2008 to 2018),
- Research and development spending as a percentage of sales (2008),
- Venture capital investment (2010), and
- Industry output multiplier (2009).

Hampton Roads Capabilities

Hampton Roads' industries differ in their positioning to take advantage of a favorable external climate or, conversely, they differ in their ability to compensate for an unfavorable external climate. The relative strengths and weaknesses of Hampton Roads' industries are referred to as "capabilities." As with the external climate indicators, Hampton Roads' capabilities provide measures to evaluate potential industries in terms of economic performance, innovative potential, and value added.

Economic performance considers the industry's competitiveness relative to the nation and its recent growth based on the assumption that industries that already perform well in Hampton Roads are in the best position for continued growth if the external environment is positive. Innovation potential is comprised of leading indicators that point to

¹¹ Each major category was weighed equally and each factor within each major category was weighted equally



future development such as research contracts. The value added by an industry, or its multiplier, identifies the extent to which the industry will create additional income and jobs for other industries in the state.

Specifically, the Hampton Roads Capabilities Index includes:

- Location quotient (2011)—a measure of industry competitiveness in the region,¹²
- Change in location quotient (2001 to 2011),
- Annual average employment growth (2001 to 2011)
- Relative wages—Hampton Roads' average annual wages as a share of U.S. average annual wages (2011),
- Average annual wage growth (2001 to 2011)
- Federal R&D contract awards to Hampton Roads firms (2011), and
- Hampton Roads Industry Multipliers (2010).

¹² The location quotient measures the degree to which an industry is concentrated or specialized in a region relative to the nation, by computing the ratio of the share of an industry's employment in a region to the same industry's share of employment in the nation.

